



Lenovo M4350 User Guide

Machine Types: 90AG and 10154

Note: Before using this information and the product it supports, be sure to read and understand the “Important safety information” on page iii and Appendix A “Notices” on page 43.

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Important safety information

CAUTION:

Before using this manual, be sure to read and understand all the related safety information for this product. Refer to the information in this section and the safety information in the *Safety, Warranty, and Setup Guide* that you received with this product. Reading and understanding this safety information reduces the risk of personal injury and damage to your product.

If you no longer have a copy of the *Safety, Warranty, and Setup Guide*, you can obtain a Portable Document Format (PDF) version from the Lenovo® Support Web site at <http://support.lenovo.com>. The Lenovo Support Web site also provides the *Safety, Warranty, and Setup Guide* and this *User Guide* in additional languages.

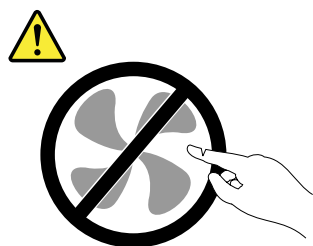
Service and upgrades

Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center or your documentation. Only use a Service Provider who is approved to repair your particular product.

Note: Some computer parts can be upgraded or replaced by the customer. Upgrades typically are referred to as options. Replacement parts approved for customer installation are referred to as Customer Replaceable Units, or CRUs. Lenovo provides documentation with instructions when it is appropriate for customers to install options or replace CRUs. You must closely follow all instructions when installing or replacing parts. The Off state of a power indicator does not necessarily mean that voltage levels inside a product are zero. Before you remove the covers from a product equipped with a power cord, always make sure that the power is turned off and that the product is unplugged from any power source.

Although there are no moving parts in your computer after the power cord has been disconnected, the following warnings are required for your safety.

CAUTION:



Hazardous moving parts. Keep fingers and other body parts away.

CAUTION:



Before replacing any CRUs, turn off the computer and wait three to five minutes to let the computer cool before opening the cover.

Static electricity prevention

Static electricity, although harmless to you, can seriously damage computer components and options. Improper handling of static-sensitive parts can cause damage to the part. When you unpack an option or CRU, do not open the static-protective package containing the part until the instructions direct you to install it.

When you handle options or CRUs, or perform any work inside the computer, take the following precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters, memory modules, and other circuit boards by the edges. Never touch exposed circuitry.
- Prevent others from touching components.
- When you install a static-sensitive option or CRU, touch the static-protective package containing the part to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.
- When possible, remove the static-sensitive part from the static-protective packaging and install the part without setting it down. When this is not possible, place the static-protective packaging on a smooth, level surface and place the part on it.
- Do not place the part on the computer cover or other metal surface.

Power cords and power adapters

Use only the power cords and power adapters supplied by the product manufacturer.

The power cords shall be safety approved. For Germany, it shall be H05VV-F, 3G, 0.75 mm², or better. For other countries, the suitable types shall be used accordingly.

Never wrap a power cord around a power adapter or other object. Doing so can stress the cord in ways that can cause the cord to fray, crack, or crimp. This can present a safety hazard.

Always route power cords so that they will not be walked on, tripped over, or pinched by objects.

Protect power cord and power adapters from liquids. For instance, do not leave your power cord or power adapter near sinks, tubs, toilets, or on floors that are cleaned with liquid cleansers. Liquids can cause a short circuit, particularly if the power cord or power adapter has been stressed by misuse. Liquids also can cause gradual corrosion of power cord terminals and/or the connector terminals on a power adapter, which can eventually result in overheating.

Always connect power cords and signal cables in the correct order and ensure that all power cord connectors are securely and completely plugged into receptacles.

Do not use any power adapter that shows corrosion at the ac input pins or shows signs of overheating (such as deformed plastic) at the ac input or anywhere on the power adapter.

Do not use any power cords where the electrical contacts on either end show signs of corrosion or overheating or where the power cord appears to have been damaged in any way.

Extension cords and related devices

Ensure that extension cords, surge protectors, uninterruptible power supplies, and power strips that you use are rated to handle the electrical requirements of the product. Never overload these devices. If power strips are used, the load should not exceed the power strip input rating. Consult an electrician for more information if you have questions about power loads, power requirements, and input ratings.

Plugs and outlets

If a receptacle (power outlet) that you intend to use with your computer equipment appears to be damaged or corroded, do not use the outlet until it is replaced by a qualified electrician.

Do not bend or modify the plug. If the plug is damaged, contact the manufacturer to obtain a replacement.

Do not share an electrical outlet with other home or commercial appliances that draw large amounts of electricity; otherwise, unstable voltage might damage your computer, data, or attached devices.

Some products are equipped with a three-pronged plug. This plug fits only into a grounded electrical outlet. This is a safety feature. Do not defeat this safety feature by trying to insert it into a non-grounded outlet. If you cannot insert the plug into the outlet, contact an electrician for an approved outlet adapter or to replace the outlet with one that enables this safety feature. Never overload an electrical outlet. The overall system load should not exceed 80 percent of the branch circuit rating. Consult an electrician for more information if you have questions about power loads and branch circuit ratings.

Be sure that the power outlet you are using is properly wired, easily accessible, and located close to the equipment. Do not fully extend power cords in a way that will stress the cords.

Be sure that the power outlet provides the correct voltage and current for the product you are installing.

Carefully connect and disconnect the equipment from the electrical outlet.

External devices

Do not connect or disconnect any external device cables other than Universal Serial Bus (USB) and 1394 cables while the computer power is on; otherwise, you might damage your computer. To avoid possible damage to attached devices, wait at least five seconds after the computer is shut down to disconnect external devices.

Heat and product ventilation

Computers, power adapters, and many accessories can generate heat when turned on and when batteries are charging. Always follow these basic precautions:

- Do not leave your computer, power adapter, or accessories in contact with your lap or any part of your body for an extended period when the products are functioning or when the battery is charging. Your computer, power adapter, and many accessories produce some heat during normal operation. Extended contact with the body could cause discomfort or, potentially, a skin burn.
- Do not charge the battery or operate your computer, power adapter, or accessories near flammable materials or in explosive environments.
- Ventilation slots, fans, and heat sinks are provided with the product for safety, comfort, and reliable operation. These features might inadvertently become blocked by placing the product on a bed, sofa, carpet, or other flexible surface. Never block, cover, or disable these features.

Inspect your desktop computer for dust accumulation at least once every three months. Before inspecting your computer, turn off the power and unplug the computer's power cord from the electrical outlet; then remove any dust from vents and perforations in the bezel. If you notice external dust accumulation, then examine and remove dust from the inside of the computer including heat sink inlet fins, power supply vents, and fans. Always turn off and unplug the computer before opening the cover. If possible, avoid operating your computer within two feet of high-traffic areas. If you must operate your computer in or near a high-traffic area, inspect and, if necessary, clean your computer more frequently.

For your safety and to maintain optimum computer performance, always follow these basic precautions with your desktop computer:

- Keep the cover closed whenever the computer is plugged in.
- Regularly inspect the outside of the computer for dust accumulation.

- Remove dust from vents and any perforations in the bezel. More frequent cleanings might be required for computers in dusty or high-traffic areas.
- Do not restrict or block any ventilation openings.
- Do not store or operate your computer inside furniture, as this might increase the risk of overheating.
- Airflow temperatures into the computer should not exceed 35°C (95°F).
- Do not install air filtration devices. They may interfere with proper cooling.

Operating environment

The optimal environment in which to use your computer is 10°C-35°C (50°F-95°F) with humidity ranging between 35% and 80%. If your computer is stored or transported in temperatures less than 10°C (50°F), allow the cold computer to rise slowly to an optimal operating temperature of 10°C-35°C (50°F-95°F) before use. This process could take two hours in extreme conditions. Failure to allow your computer to rise to an optimal operating temperature before use could result in irreparable damage to your computer.

If possible, place your computer in a well-ventilated and dry area without direct exposure to sunshine.

Keep electrical appliances such as an electric fan, radio, high-powered speakers, air conditioner, and microwave oven away from your computer because the strong magnetic fields generated by these appliances can damage the monitor and data on the hard disk drive.

Do not place any beverages on top of or beside the computer or other attached devices. If liquid is spilled on or in the computer or an attached device, a short circuit or other damage might occur.

Do not eat or smoke over your keyboard. Particles that fall into your keyboard can cause damage.

Modem safety information

CAUTION:

To reduce the risk of fire, use only No. 26 AWG or larger (for example, No. 24 AWG) telecommunication line cord listed by Underwriters Laboratories (UL) or certified by the Canadian Standards Association (CSA).

To reduce the risk of fire, electrical shock, or injury when using telephone equipment, always follow basic safety precautions, such as:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

Laser compliance statement



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

**DANGER**

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Power supply statement

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Cleaning and maintenance

Keep your computer and workspace clean. Shut down the computer and then disconnect the power cord before cleaning the computer. Do not spray any liquid detergent directly on the computer or use any detergent containing flammable material to clean the computer. Spray the detergent on a soft cloth and then wipe the computer surfaces.

Chapter 1. Product overview

This chapter provides information about the computer specifications, locations of connectors, and parts on the system board.

Specifications

This section lists the specifications for your computer.

Preinstalled operating system

Your computer is preinstalled with one of the following operating systems:

- Microsoft® Windows® 8 operating system
- DOS

Environment

- Air temperature:
 - Operating: 10°C to 35°C (50°F to 95°F)
 - Storage in original shipping package: -40°C to 60°C (-40°F to 140°F)
 - Storage without package: -10°C to 60°C (14°F to 140°F)
- Humidity:
 - Operating: 20% to 80% (non-condensing)
 - Non-operating: 20% to 90% (non-condensing)
- Altitude:
 - Operating: -15.2 to 3048 m (-50 to 10 000 ft)
 - Storage: -15.2 to 10 668 m (-50 to 35 000 ft)

Electrical input

- Input voltage:
 - Low range:
 - Minimum: 100 V ac
 - Maximum: 127 V ac
 - Input frequency range: 50 to 60 Hz
 - Voltage-selection switch setting: 115 V ac
 - High range:
 - Minimum: 200 V ac
 - Maximum: 240 V ac
 - Input frequency range: 50 to 60 Hz
 - Voltage-selection switch setting: 230 V ac

Locations

This section provides information to help you locate the connectors on the front and rear of your computer and parts on the system board.

Locating connectors, controls, and indicators on the front of your computer

Figure 1 “Front connector, control, and indicator locations” on page 2 shows the locations of the connectors, controls, and indicators on the front of your computer.

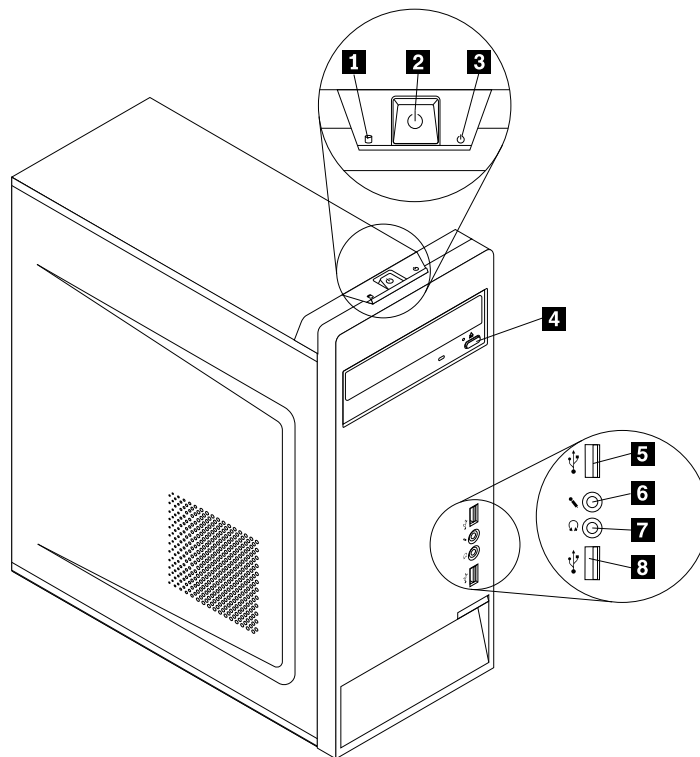


Figure 1. Front connector, control, and indicator locations

- | | |
|---|-------------------------------|
| 1 Hard disk drive activity indicator | 5 USB 2.0 connector |
| 2 Power switch | 6 Microphone connector |
| 3 Power indicator | 7 Headphone connector |
| 4 Optical drive eject/close button | 8 USB 2.0 connector |

Locating connectors on the rear of your computer

Figure 2 “Rear connector locations” on page 3 shows the locations of the connectors on the rear of your computer. Some connectors on the rear of your computer are color-coded to help you determine where to connect the cables on your computer.

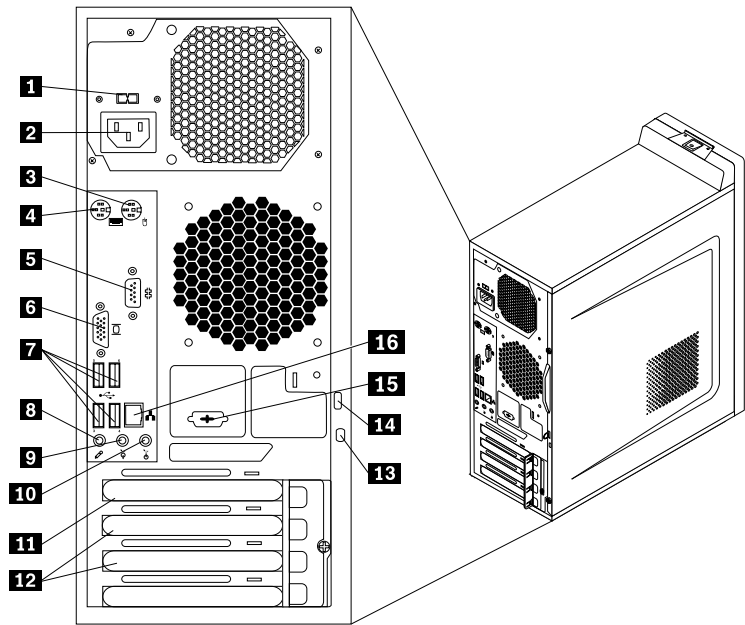


Figure 2. Rear connector locations

- | | |
|--|--|
| 1 Voltage-selection switch (available on some models) | 9 Audio line-out connector |
| 2 Power cord connector | 10 Audio line-in connector |
| 3 PS/2 mouse connector | 11 PCI Express x16 graphics card slot |
| 4 PS/2 keyboard connector | 12 PCI Express x1 card slots (2) |
| 5 Serial port | 13 Integrated cable lock (Kensington lock) slot |
| 6 VGA monitor connector | 14 Padlock loop |
| 7 USB connectors (4) | 15 Optional serial port |
| 8 Microphone connector | 16 Ethernet connector |

Connector	Description
Audio line-in connector	Used to receive audio signals from an external audio device, such as a stereo system. When you attach an external audio device, a cable is connected between the audio line-out connector of the device and the audio line-in connector of the computer.
Audio line-out connector	Used to send audio signals from the computer to external devices, such as powered stereo speakers (speakers with built-in amplifiers), headphones, multimedia keyboards, or the audio line-in connector on a stereo system or other external recording device.
Ethernet connector	Used to attach an Ethernet cable for a local area network (LAN). Note: To operate the computer within FCC Class B limits, use a Category 5 Ethernet cable.

Connector	Description
Microphone connector	Used to attach a microphone to your computer when you want to record sound or if you use speech-recognition software.
Serial port	Used to attach an external modem, a serial printer, or other devices that use a 9-pin serial port.
USB connector	Used to attach a device that requires a USB connector, such as a USB keyboard, a USB mouse, a USB scanner, or a USB printer. If you have more than eight USB devices, you can purchase a USB hub, which you can use to connect additional USB devices.
VGA monitor connector	Used to attach a VGA monitor or other devices that use a VGA monitor connector.

Locating parts on the system board

Figure 3 “System board part locations” on page 4 shows the locations of the parts on the system board.

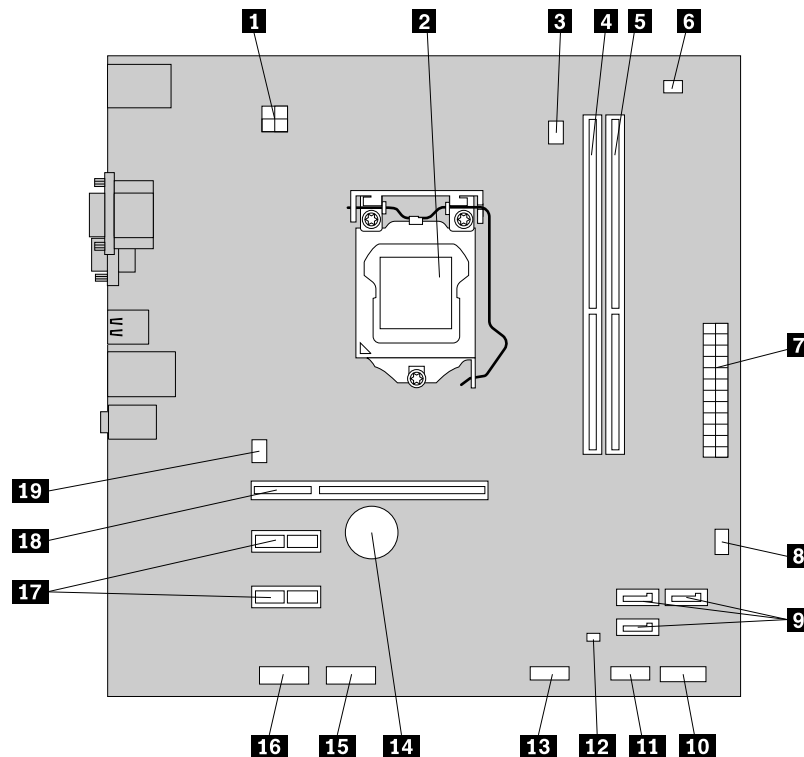


Figure 3. System board part locations

- | | |
|---------------------------------------|---|
| 1 4-pin power connector | 11 Front USB connector 1 (for connecting USB ports on the front bezel) |
| 2 Microprocessor | 12 Clear CMOS (Complementary Metal Oxide Semiconductor) /Recovery jumper |
| 3 Microprocessor fan connector | 13 Front USB connector 2 (for connecting an additional USB device) |
| 4 Memory slot 1 (DIMM1) | 14 Battery |
| 5 Memory slot 2 (DIMM2) | 15 Serial (COM2) connector |
| 6 Thermal sensor connector | 16 Front audio connector |

- | | |
|--|--|
| 7 24-pin power connector | 17 PCI Express x1 card slots (2) |
| 8 Power fan connector | 18 PCI Express x16 graphics card slot |
| 9 SATA connectors (3) | 19 System fan connector |
| 10 Front panel connector (for connecting LED indicators and the power switch) | |

Chapter 2. You and your computer

This chapter provides information about accessibility, comfort, and relocating your computer to other countries or regions.

Accessibility and comfort

Good ergonomic practice is important to get the most from your personal computer and to avoid discomfort. Arrange your workplace and the equipment you use to suit your individual needs and the kind of work that you perform. In addition, use healthy work habits to maximize your performance and comfort while using your computer.

The following topics provide information about arranging your work area, setting up your computer equipment, and establishing healthy work habits.

Lenovo is committed to providing people with disabilities greater access to information and technology. As a result, the following information provides ways to help users that have hearing, vision, and mobility limitations get the most out of their computer experience.

Assistive technologies enable users to access information in the most appropriate way. Some of these technologies are already provided in your operating system, others can be purchased through vendors, or accessed through the World Wide Web:

<http://www.lenovo.com/healthycomputing>

Arranging your workspace

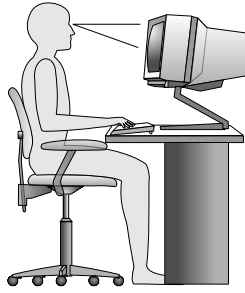
To get the most from your computer, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets can also affect the way you arrange your workspace.

Comfort

Although no single working position is ideal for everyone, here are a few guidelines to help you find a position that suits you best.

Sitting in the same position for a long time can cause fatigue. The backrest and seat of your chair should adjust independently and provide good support. The seat should have a curved front to relieve pressure on the thighs. Adjust the seat so that your thighs are parallel to the floor and your feet are either flat on the floor or on a footrest.

When using the keyboard, keep your forearms parallel to the floor and your wrists in a comfortable position. Use a light touch on the keyboard and your hands and fingers relaxed. Change the angle of the keyboard for maximum comfort by adjusting the position of the keyboard feet.



Adjust the monitor so the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 inches), and position it so you can view it without having to twist your body. Also, position other equipment you use regularly, such as the telephone or a mouse, within easy reach.

Glare and lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Reflected light from shiny surfaces can cause annoying reflections on your monitor screen. Place the monitor at right angles to windows and other light sources, when possible. Reduce overhead lighting, if necessary, by turning off lights or using lower wattage bulbs. If you install the monitor near a window, use curtains or blinds to block the sunlight. You can adjust the brightness and contrast controls on the monitor as the room lighting changes throughout the day.

Where it is impossible to avoid reflections or to adjust the lighting, an antiglare filter placed over the screen might be helpful. However, these filters might affect the clarity of the image on the screen; try them only after you have exhausted other methods of reducing glare.

Dust buildup compounds problems associated with glare. Remember to clean your monitor screen periodically using a soft cloth as directed in your monitor documentation.

Air circulation

Your computer and monitor produce heat. The computer has a fan that pulls in fresh air and forces out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, which might result in a malfunction or damage. Place the computer and monitor so that nothing blocks the air vents; usually, 51 mm (2 inches) of air space is sufficient. Also, make sure the vented air is not blowing on people.

Electrical outlets and cable lengths

The location of electrical outlets, the length of power cords and cables that connect to the monitor, printer, and other devices might determine the final placement of your computer.

When arranging your workspace:

- Avoid the use of extension cords. When possible, plug the computer power cord directly into an electrical outlet.
- Keep power cords and cables neatly routed away from walkways and other areas where they might get kicked accidentally.

For more information about power cords, see “Power cords and power adapters” on page iv.

Moving your computer to another country or region

When you move your computer to another country or region, you must take local electrical standards into consideration. This section provides information on the following:

- “Voltage-selection switch” on page 9
- “Replacement power cords” on page 9

Voltage-selection switch

Some computers are equipped with a voltage-selection switch located near the power-cord connection point on the computer and some computers do not have a voltage-selection switch. Before you install your computer or relocate your computer to another country or region, you must be certain that you have matched your computer to the voltage available at your electrical outlet.

CAUTION:

You must know the voltage of the electrical connection (outlet) where your computer will be connected. If you do not know the voltage, contact your local electric company or refer to official Web sites or other literature for travelers to the country or region where you are located.

If your computer has a voltage-selection switch, you must set the switch to match the voltage available at your electrical outlet. Setting the voltage-selection switch incorrectly will cause the computer to malfunction and might cause permanent damage to the computer. Do not connect the computer to an electrical outlet until you have verified that the voltage-selection switch setting matches the voltage available at the electrical outlets.

If your computer does not have a voltage-selection switch, inspect the voltage-rating label on the bottom of the computer and note the following:

- If the voltage-rating label shows a range of either “100-127 V” or “200-240 V,” you must ensure that the voltage provided at the electrical outlet matches the voltage rating on the computer label. If it does not match, do not attempt to connect the computer to the electrical outlet, unless an external device such as a voltage-converting transformer is used.
- If the voltage-rating label shows a dual range of “100-127 V” and “200-240 V,” this signifies that the computer is suitable for worldwide operation and the computer will automatically adjust to the voltage at the electrical outlet regardless of the country or region where the computer is being connected.

Replacement power cords

If you relocate your computer to a country or region that uses an electrical outlet style different from the type you are currently using, you will have to purchase either electrical plug adapters or new power cords. You can order power cords directly from Lenovo.

For power cord information and part numbers, go to:
<http://www.lenovo.com/powercordnotice>

Chapter 3. Security

This chapter provides information about how to protect your computer from theft and unauthorized use.

Locking the computer cover

Locking the computer cover helps prevent unauthorized people from gaining access to the inside of your computer. Your computer comes with a padlock loop so that the computer cover cannot be removed when a padlock is installed.

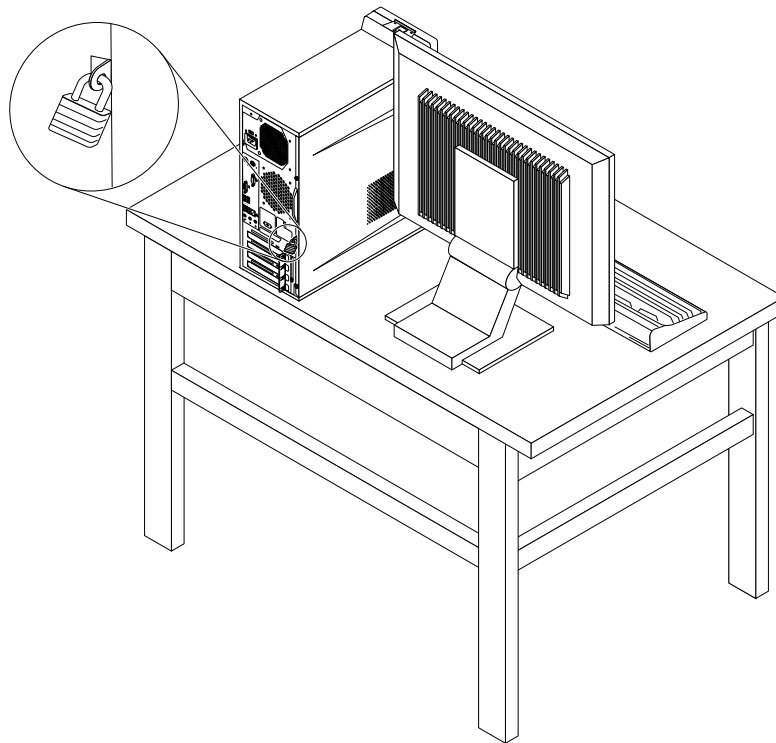


Figure 4. Installing a padlock

Attaching an integrated cable lock

An integrated cable lock, sometimes referred to as the Kensington lock, can be used to secure your computer to a desk, table, or other non-permanent fixture. The cable lock attaches to the integrated cable lock slot at the rear of your computer and is operated with a key. The cable lock also locks the buttons used to open the computer cover. This is the same type of lock used with many notebook computers. You can order an integrated cable lock directly from Lenovo by searching for *Kensington* at: <http://support.lenovo.com>

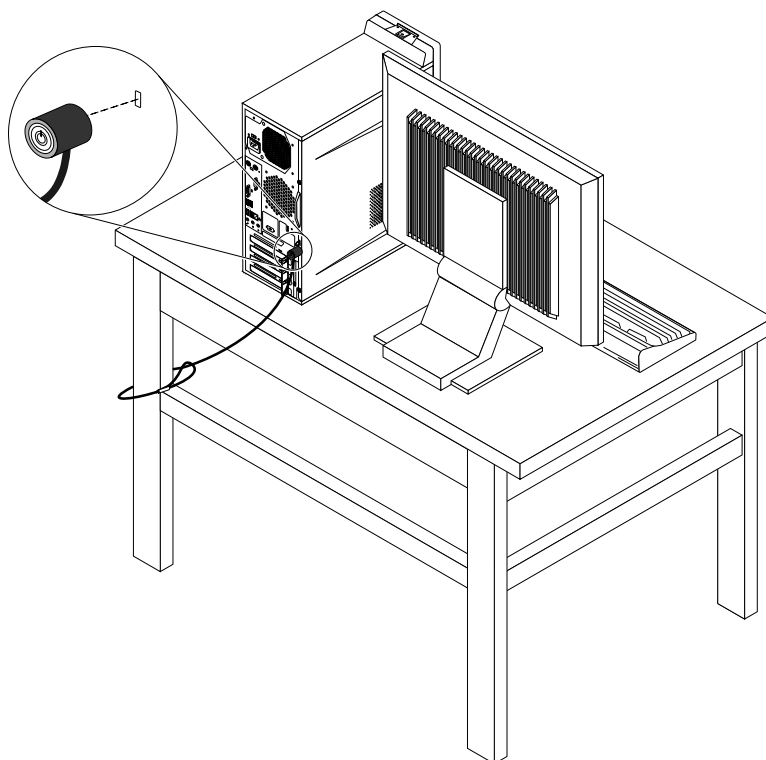


Figure 5. Integrated cable lock

Using passwords

You can set a variety of passwords through the Microsoft Windows operating system and through the BIOS of your computer to help deter unauthorized use of your computer.

BIOS passwords

You can use the BIOS Setup Utility program to set passwords to prevent unauthorized access to your computer and data. The following types of passwords are available:

- **Power-On Password:** When a Power-On Password is set, you are prompted to type a valid password each time the computer is turned on. The computer cannot be used until the valid password is typed in. For more information, see “Power-On Password” on page 20.
- **Hard Disk Password:** Setting a Hard Disk Password prevents unauthorized access to the data on the hard disk drive. When a Hard Disk Password is set, you are prompted to type a valid password each time you try to access the hard disk drive. For more information, see “Hard Disk Password” on page 20.

- **Administrator Password:** Setting an Administrator Password deters unauthorized users from changing configuration settings. If you are responsible for maintaining the configuration settings of several computers, you might want to set an Administrator Password. For more information, see “Administrator Password” on page 20.

You do not have to set any passwords to use your computer. However, using passwords improves computing security.

Windows passwords

Depending on your version of the Windows operating system, you can use passwords for a variety of features, including controlling login access, access to shared resources, network access, and individual user settings.

Using and understanding firewalls

A firewall can be hardware, software, or a combination of both depending on the level of security required. Firewalls work on a set of rules to determine which inbound and outbound connections are authorized. If your computer is preinstalled with a firewall program, it helps protect against computer Internet security threats, unauthorized access, intrusions, and Internet attacks. It also protects your privacy. For more information about how to use the firewall program, refer to the help system of your firewall program.

Chapter 4. Recovery information

This chapter provides information about the recovery solutions provided by Lenovo.

- “Recovery information for the Windows 8 operating system” on page 15
- “Using Rescue System” on page 16

Recovery information for the Windows 8 operating system

This section provides information about the recovery solutions provided on computers preinstalled with the Windows 8 operating system.

Refreshing your computer

If your computer does not perform well and the problem might be caused by a recently installed program, you can refresh your computer without losing your personal files or changing your settings.

Attention: If you refresh your computer, the programs that came with your computer and the programs that you installed from Windows Store will be reinstalled, but all other programs will be removed.

To refresh your computer, do the following:

1. Move the cursor to the top-right or bottom-right corner of the screen to display the charms. Click **Settings → Change PC settings → General**.
2. In the **Refresh your PC without affecting your files** section, click **Get started**.

Resetting your computer to the factory default settings

You can reset your computer to the factory default settings. Resetting the computer will reinstall the operating system, and reinstall all the programs and settings that came with your computer.

Attention: If you reset your computer, all your personal files and settings will be deleted. To avoid data loss, make a backup copy of all the data that you want to keep.

To reset your computer, do the following:

1. Move the cursor to the top-right or bottom-right corner of the screen to display the charms. Click **Settings → Change PC settings → General**.
2. In the **Remove everything and reinstall Windows** section, click **Get started**.

Advanced startup options

Advanced startup options enable you to change the startup settings of your Windows operating system, start the computer from an external device, or restore the Windows operating system from a system image.

To use the advanced startup options, do the following:

1. Move the cursor to the top-right or bottom-right corner of the screen to display the charms. Click **Settings → Change PC settings → General**.
2. In the **Advanced startup** section, click **Restart now → Troubleshoot → Advanced options**.
3. Restart your computer following the instructions on the screen.

For more details about the recovery solutions provided on computers preinstalled with the Windows 8 operating system, refer to the help information system of the Windows 8 operating system.

Using Rescue System

Attention: Using OneKey Recovery will result in loss of data.

Notes:

- You can restore the C: drive of the computer to factory default settings or to the last system backup status using OneKey Recovery. If you do this, all of the existing data on drive C: will be lost, but the content and format of the other partitions of the hard disk drive will remain unchanged.
- If you want to install an operating system and back it up with OneKey Recovery, you must format the C: partition in NTFS format and install the operating system on the C: partition. Otherwise, the OneKey Recovery system cannot run.

Note about the service partition:

The files and relevant data used by the rescue system are saved in the service partition. Deleting this partition will make the rescue system unusable. For more detailed information, see the following instructions:

From the Search charm, select **Apps → Control Panel → Administrative Tools → Computer Management → Disk Management**, you can see the service partition, which must not be deleted.

Note: The recovery files and relevant data used by the rescue system are saved in the service partition. If the service partition is deleted or damaged by someone other than authorized Lenovo service personnel, Lenovo will not be liable for any losses arising therefrom in any way.

OneKey Recovery

OneKey Recovery is an easy-to-use application. You can use it to restore your computer to the system default or to a previously backed up state.

Detailed Operation Procedure:

1. Repeatedly press and release the **F2** key once turning on the computer until the **Lenovo Rescue System** opens, then select **OneKey Recovery**.

Note: System Recovery will overwrite all of the data on the C: drive. To prevent loss of data, be sure to back up relevant data before performing system recovery.

2. Follow the on-screen instructions to select the backup task you want to restore from and the disk where you want to install the operating system, then press **Next** to start the restore.
3. Please wait during the process of system recovery. Do not interrupt the operation during the recovery process.
4. After the system is recovered successfully, the software will prompt you to restart the computer. Restart the computer and start the operating system.

Driver and Application Installation

The Driver and Application Installation function in the rescue system provides a way for the user to conveniently reinstall all of the Lenovo applications and drivers that were shipped with your Lenovo hardware.

Method 1: Automatic Installation

Repeatedly press and release the **F2** key once turning on the computer until the **Lenovo Rescue System** opens, then select **Driver and Application Installation**. Follow the on-screen prompts to install the Lenovo drivers and applications. Click OK to start installing the Lenovo Driver and Application Installation software. The system will restart. After the system has restarted, the drivers and application installation process will continue until it has completed.

Method 2: Manual Installation

In the Windows system, Select **Driver and Application Installation** from the **Search** charm.

After starting the procedure, install the drivers and software manually by following the prompts.

Notes:

- Do not install software which is already installed on the computer.
- Make sure that the Driver and Application Installation software has been automatically installed before starting the operating system. The manual installation function can only be used after the software has been installed.

Chapter 5. Using the Setup Utility program

The Setup Utility program is used to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the operating system settings might override any similar settings in the Setup Utility program.

Starting the Setup Utility program

To start the Setup Utility program, do the following:

1. Make sure your computer is turned off.
2. Repeatedly press and release the F1 key when turning on the computer. When you hear multiple beeps or see a logo screen, release the F1 key.

Note: If a Power-On Password or an Administrator Password has been set, the Setup Utility program menu will not be displayed until you type the correct password. For more information, see “Using passwords” on page 19.

When the POST detects that the hard disk drive has been removed from your computer or the memory module size has decreased, an error message will be displayed when you start the computer and you will be prompted to do one of the following:

- Press F1 to enter the Setup Utility program.

Note: After you enter the Setup Utility program, press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit. The error message will not be displayed again.

- Press F2 to bypass the error message and log in to the operating system.

Note: You have to enable the configuration change detection feature for the POST to detect the removal of the hard disk drive. To enable the configuration change detection feature, do the following:

1. Start the Setup Utility program.
2. From the Setup Utility program main menu, select **Security → Configuration Change Detection**, and press Enter.
3. Select **Enabled** and press Enter.
4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

Viewing and changing settings

The Setup Utility program menu lists various items about the system configuration. To view or change settings, start the Setup Utility program. See “Starting the Setup Utility program” on page 19. Then, follow the instructions on the screen.

You can use either the keyboard or the mouse to navigate through BIOS menu choices. The keys used to perform various tasks are displayed at the bottom of each screen.

Using passwords

By using the Setup Utility program, you can set passwords to prevent unauthorized access to your computer and data. The following types of passwords are available:

- Power-On Password

- Administrator Password
- Hard Disk Password

You do not have to set any passwords to use your computer. However, using passwords improves computing security. If you decide to set any passwords, read the following sections.

Password considerations

A password can be any combination of up to 64 alphabetic and numeric characters. For security reasons, it is recommended to use a strong password that cannot be easily compromised. To set a strong password, use the following guidelines:

- Have at least eight characters in length
- Contain at least one alphabetic character and one numeric character
- Setup Utility program and hard disk drive passwords are not case sensitive
- Not be your name or your user name
- Not be a common word or a common name
- Be significantly different from your previous passwords

Power-On Password

When a Power-On Password is set, you are prompted to type a valid password each time the computer is turned on. The computer cannot be used until the valid password is typed in.

Administrator Password

Setting an Administrator Password deters unauthorized users from changing configuration settings. If you are responsible for maintaining the configuration settings of several computers, you might want to set an Administrator Password.

When an Administrator Password is set, you are prompted to type a valid password each time you try to access the Setup Utility program. The Setup Utility program cannot be accessed until a valid password is typed in.

If both the Power-On Password and Administrator Password are set, you can type either password. However, you must use your Administrator Password to change any configuration settings.

Hard Disk Password

Setting a Hard Disk Password prevents unauthorized access to the data on the hard disk drive. When a Hard Disk Password is set, you are prompted to type a valid password each time you try to access the hard disk drive.

Notes:

- After you set a Hard Disk Password, your data on the hard disk drive is protected even if the hard disk drive is removed from one computer and installed in another.
- If the Hard Disk Password is forgotten, there is no way to reset the password or recover data from the hard disk drive.

Setting, changing, and deleting a password

To set, change, or delete a password, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.

2. From the Setup Utility program main menu, select **Security**.
3. Depending on the password type, select **Set Power-On Password**, **Set Administrator Password**, or **Hard Disk Password**.
4. Follow the instructions on the right side of the screen to set, change, or delete a password.

Note: A password can be any combination of up to 64 alphabetic and numeric characters. For more information, see “Password considerations” on page 20.

Enabling or disabling a device

This section provides information on how to enable or disable user access to the following devices:

USB Setup	Use this option to enable or disable a USB connector. When a USB connector is disabled, the device connected to the USB connector cannot be used.
SATA Controller	When this feature is set to Disable , all devices connected to the SATA connectors (such as hard disk drives or the optical drive) are disabled and cannot be accessed.

To enable or disable a device, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.
2. From the Setup Utility program main menu, select **Devices**.
3. Depending on the device you want to enable or disable, do one of the following:
 - Select **USB Setup** to enable or disable a USB device.
 - Select **ATA Drives Setup → SATA Controller** to enable or disable a SATA device.
4. Select the desired settings and press Enter.
5. Press F10 to save and exit the Setup Utility program. See “Exiting the Setup Utility program” on page 22.

Selecting a startup device

If your computer does not start up from a device such as the disc or hard disk drive as expected, do one of the following to select the startup device you want.

Selecting a temporary startup device

Use this procedure to select a temporary startup device.

Note: Not all discs and hard disk drives are bootable.

1. Turn off your computer.
2. Repeatedly press and release the F12 key when turning on the computer. When the Please select boot device window displays, release the F12 key.
3. Select the desired startup device and press Enter. The computer will start up from the device you selected.

Note: Selecting a startup device from the Please select boot device window does not permanently change the startup sequence.

Selecting or changing the startup device sequence

To view or permanently change the configured startup device sequence, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.
2. From the Setup Utility program main menu, select **Startup**.

3. Select the devices for the Primary Startup Sequence, the Automatic Startup Sequence, and the Error Startup Sequence. Read the information displayed on the right side of the screen.
4. Press F10 to save and exit the Setup Utility program. See “Exiting the Setup Utility program” on page 22.

Enabling ErP compliance mode

You can enable the energy-related products directive (ErP) compliance mode through the **Power** menu in the Setup Utility program to reduce the consumption of electricity when your computer is in standby or off mode.

To enable ErP compliance mode in the Setup Utility program, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.
2. From the Setup Utility program main menu, select **Power → Enhanced Power Saving Mode**, and press Enter.
3. Select **Enabled** and press Enter.
4. From the **Power** menu, select **Automatic Power On** and press Enter.
5. Select **Wake on Lan** and press Enter.
6. Select **Disabled** and press Enter.
7. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

Note: When ErP compliance mode is enabled, you can wake up your computer by doing one of the following:

- Pressing the power switch
- Enabling the wake up on alarm feature

The wake up on alarm feature enables your computer to wake up at a set time. To enable the wake up on alarm feature, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.
2. From the Setup Utility program main menu, select **Power → Automatic Power On**, and press Enter.
3. Select **Wake Up on Alarm** and press Enter. Then follow the instructions on the screen.
4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

- Enabling the after power loss feature

The after power loss feature enables your computer to wake up when the power supply resumes after a sudden loss of electricity. To enable the after power loss feature, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 19.
2. From the Setup Utility program main menu, select **Power → After Power Loss**, and press Enter.
3. Select **Power On** and press Enter.
4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

Exiting the Setup Utility program

After you finish viewing or changing settings, press Esc to return to the Setup Utility program main menu. You might have to press Esc several times. Do one of the following:

- If you want to save the new settings, press F10 to save and exit the Setup Utility program.

- If you do not want to save the settings, select **Exit → Discard Changes and Exit**, and then press Enter. When the Reset Without Saving window opens, select **Yes**, and then press Enter to exit the Setup Utility program.
- If you want to return to the default settings, press F9 to load the default settings, and then press F10 to save and exit the Setup Utility program.

Chapter 6. Preventing problems

This chapter provides information that can help you avoid common problems and keep your computer running smoothly.

Keeping your computer current

In some situations you may find it necessary to have the most current software programs, device drivers, or operating system. This section explains how to get the latest updates for your computer.

Select any of the following topics:

- “Getting the latest device drivers for your computer” on page 25
- “Updating your operating system” on page 25

Getting the latest device drivers for your computer

You can download and install updated device drivers from the Lenovo Web site by doing the following:

Note: Because Lenovo makes constant improvements to its Web sites, the Web page contents are subject to change without notice, including the contents referenced in the following procedure.

Attention: Do not download updated device drivers from the Windows Update Web site. The device drivers provided on the Windows Web site have not been tested by Lenovo and using them might cause unexpected problems. Obtain updated device drivers from Lenovo.

1. Go to <http://support.lenovo.com>.
2. Click **Download & Drivers**.
3. Select the machine type of your computer from the machine type list.
4. Click the category of device for which you need the device driver.
5. Click the appropriate device driver.
6. Download and install the device driver.

Updating your operating system

Microsoft makes updates available for the various Windows operating systems through the Microsoft Windows Update Web site. The Web site automatically determines what Windows updates are available for your specific computer and lists those updates only. Updates could include security fixes, new versions of Windows components (such as Media Player), fixes to other portions of the Windows operating system, or enhancements.

Attention: Do not download updated device drivers from the Windows Web site. The device drivers provided on the Windows Web site have not been tested by Lenovo and using them might cause unexpected problems. Obtain updated device drivers from Lenovo. See “Getting the latest device drivers for your computer” on page 25 for more information.

To access the Microsoft Windows Update site, do the following:

1. Go to <http://windowsupdate.microsoft.com/>.
2. Follow the instructions on the screen.

Cleaning and maintenance

With appropriate care and maintenance your computer will serve you reliably. The following topics offer information to help you keep your computer in top working order.

- “Basics” on page 26
- “Cleaning your computer” on page 26
 - “Computer” on page 26
 - “Keyboard” on page 26
 - “Optical mouse” on page 27
 - “Display screen” on page 27
- “Good maintenance practices” on page 27

Basics

Here are some basic points about keeping your computer functioning properly:

- Keep your computer in a clean, dry environment. Make sure it rests on a flat, steady surface.
- Do not place items on top of the monitor or cover any of the vents in the monitor or computer. These vents provide airflow to keep your computer from overheating.
- Keep food and drinks away from all parts of your computer. Food particles and spills might make the keyboard and mouse stick and unusable.
- Do not get the power switches or other controls wet. Moisture can damage these parts and cause an electrical hazard.
- Always disconnect a power cord by grasping the plug, but not the cord.

Cleaning your computer

It is a good practice to clean your computer periodically to protect the surfaces and ensure trouble-free operation.

CAUTION:

Be sure to turn off the computer and monitor power switches before cleaning the computer and monitor screen.

Computer

Use only mild cleaning solutions and a damp cloth to clean the painted surfaces of the computer.

Keyboard

To clean your computer keyboard, do the following:

1. Apply some isopropyl rubbing alcohol to a soft, dust-free cloth.
2. Wipe each keytop surface with the cloth. Wipe the keys one by one; if you wipe several keys at a time, the cloth may hook onto an adjacent key and possibly damage it. Make sure that no liquid drips onto or between the keys.
3. To remove any crumbs or dust from beneath the keys, you can use a camera blower with a brush or cool air from a hair dryer.

Note: Avoid spraying cleaner directly onto the display or the keyboard.

Optical mouse

This section provides instructions on how to clean an optical mouse.

An optical mouse uses a light-emitting diode (LED) and an optical sensor to navigate the pointer. If the pointer on the screen does not move smoothly with the optical mouse, you might need to clean the mouse.

To clean an optical mouse, do the following:

1. Turn off your computer.
2. Disconnect the mouse cable from the computer.
3. Turn the mouse upside down to check the lens.
 - a. If there is a smudge on the lens, gently clean the area with a plain cotton-tipped swab.
 - b. If there is debris in the lens, gently blow the debris away from the area.
4. Check the surface on which you are using the mouse. If you have a very intricate picture or pattern beneath the mouse, it may be difficult for the digital signal processor (DSP) to determine changes in the mouse position.
5. Reconnect the mouse cable to the computer.
6. Turn your computer back on.

Display screen

Dust buildup compounds problems associated with glare. Remember to clean your monitor screen periodically. See “Cleaning a flat-panel monitor surface” on page 27 or “Cleaning a glass-screen surface” on page 27.

Cleaning a flat-panel monitor surface

If you have a flat-panel computer display that has a flexible film surface, do the following to clean the special surface. Wipe it gently with a soft, dry cloth, or blow on the screen to remove grit and other loose particles. Then moisten a cloth with LCD cleaner and wipe the screen surface.

Many computer supply stores carry the special cleaning fluids for displays. Use cleaning fluids developed for LCD displays only. First apply the fluid to a lint-free, soft cloth, then clean the LCD display. Some computer supply stores carry pre-moistened towelettes for LCD maintenance.

Cleaning a glass-screen surface

To clean a glass-screen surface, wipe it gently with a soft, dry cloth, or blow on the screen to remove grit and other loose particles. Then use a soft cloth moistened with a nonabrasive liquid glass cleaner.

Good maintenance practices

By performing a few good maintenance practices, you can maintain good computer performance, protect your data, and be prepared in case of a computer failure.

- Empty your recycle bin on a regular basis.
- Run the Windows Disk Defragmenter program occasionally to prevent performance problems caused by an excessive number of fragmented files.
- Clean out your Inbox, Sent Items, and Deleted Items folders in your e-mail application on a regular basis.
- Make backup copies of critical data on removable media memory at regular intervals and store the removable media in a safe location. The frequency of making backup copies depends on how critical the data is to you or your business. Lenovo makes a number of removable-media storage devices available as options, such as CD-RW drives and recordable DVD drives.
- Back up your entire hard disk drive on a regular basis.

- If you are using the Windows Vista operating system, use or schedule System Restore to take a system snapshot periodically.

Note: Always take a snapshot before installing new device drivers, updating software, or installing new software.

- Keep your computer software up-to-date. See “Keeping your computer current ” on page 25 for more information.
- Keep a log book. Entries might include major software or hardware changes, device-driver updates, intermittent problems and what you did to resolve them, and any minor issues you might have experienced. A log book can help you or a Lenovo technician determine if a problem is related to change in hardware, change in software, or some other action that might have taken place.

Moving your computer

Take the following precautions before moving your computer.

1. Back up all files and data from the hard disk drive. There are a variety of backup programs available commercially. Your operating system also might have a backup program that you can use.
2. Remove all media (diskettes, compact discs, tapes, and so on) from the drives.
3. Turn off the computer and all attached devices. Your hard disk drive automatically parks the read/write head in a nondata area. This prevents damage to the hard disk drive.
4. Unplug the power cords from electrical outlets.
5. Disconnect communication cables, such as modem or network cables, from the outlets first, and then disconnect the other ends from the computer.
6. Note where any remaining cables are attached to the computer; then, remove them.
7. If you saved the original shipping cartons and packing materials, use them to pack the units. If you are using different cartons, cushion the units to avoid damage.

Chapter 7. Troubleshooting and diagnostics

This chapter describes some basic troubleshooting and diagnostic programs.

Basic troubleshooting

The following table provides information to help you troubleshoot your computer problems.

Note: If you cannot correct the problem, have the computer serviced. For a list of service and support telephone numbers, refer to the *Safety, Warranty, and Setup Guide* that comes with your computer or go to the Lenovo Support Web site at <http://www.lenovo.com/support/phone>.

Symptom	Action
The computer does not start when you press the power switch.	Verify that: • The power cord is correctly connected to the rear of the computer and to a working electrical outlet. • If your computer has a secondary power switch on the rear of the computer, make sure that it is switched on. • The power indicator on the front of the computer is on. • The computer voltage matches the voltage available at the electrical outlet for your country or region.
The monitor screen is blank.	Verify that: • The monitor signal cable is correctly connected to the monitor and to the appropriate monitor connector on the computer. • The monitor power cord is correctly connected to the monitor and to a working electrical outlet. • The monitor is turned on and the brightness and contrast controls are set correctly. • The computer voltage matches the voltage available at the electrical outlet for your country or region. • If your computer has two monitor connectors, be sure to use the connector on the graphics card.
The keyboard does not work.	Verify that: • The computer is turned on. • The keyboard is securely connected to a USB connector on the computer. • No keys are stuck.
The mouse does not work.	Verify that: • The computer is turned on. • The mouse is securely connected to a USB connector on the computer. • The mouse is clean. Refer to “Optical mouse” on page 27 for further information.
The operating system does not start.	Verify that: • The startup sequence includes the device where the operating system resides. Usually, the operating system is on the hard disk drive. For more information, see “Selecting a startup device” on page 21.
The computer beeps multiple times before the operating system starts.	Verify that no keys are stuck.

Troubleshooting procedure

Use the following procedure as a starting point for diagnosing problems you are experiencing with your computer:

1. Verify that the cables for all attached devices are connected correctly and securely.
2. Verify that all attached devices that require ac power are connected to properly grounded, functioning electrical outlets.
3. Verify that all attached devices are enabled in the BIOS settings of your computer. For more information about accessing and changing the BIOS settings, refer to your Chapter 5 “Using the Setup Utility program” on page 19.
4. Go to the “Troubleshooting” on page 30 and follow the instructions for the type of problem you are experiencing. If the Troubleshooting information does not help you resolve a problem, continue with the next step.
5. Try using a previously captured configuration to see if a recent change to hardware or software settings has caused a problem. Before restoring a previous configuration, capture your current configuration in case the older configuration settings do not solve the problem or have adverse effects. To restore a captured configuration, do the following:
 - For Windows 7: Click **Start → Control Panel → System and Security → System → System Protection → System Restore**.
 - For Windows 8: Open **Control Panel**, and then click **System and Security → System → System Protection → System Restore**.

If this does not correct the problem, continue with the next step.

6. Use an antivirus program to see if your computer has been infected by a virus. If the program detects a virus, remove the virus.

Troubleshooting

Use the troubleshooting information to find solutions to problems that have definite symptoms.

If the symptom your computer is experiencing occurred immediately after you installed a new hardware option or new software, do the following before referring to the troubleshooting information:

1. Remove the new hardware option or software. If you must remove the computer cover to remove a hardware option, make sure you review and follow the electrical safety information provided with your computer. For your safety, do not operate the computer with the cover removed.
2. Run the diagnostic programs to ensure your computer is operating correctly.
3. Reinstall the new hardware option or software following the manufacturer's instructions.

Select the problem your computer is experiencing from the following list:

- “Audio problems” on page 31
- “CD problems” on page 32
- “DVD problems” on page 33
- “Intermittent problems” on page 34
- “Keyboard, mouse, or pointing device problems” on page 34
- “Monitor problems” on page 35
- “Networking problems” on page 37
- “Performance and lockup problems” on page 39
- “Printer problems” on page 41

- “Serial port problems” on page 41
- “USB problems” on page 42

Audio problems

Select your symptom from the following list:

- “No audio in Windows” on page 31
- “An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a drive” on page 31
- “Sound comes from one external speaker only” on page 31
- “No audio in DOS applications or games” on page 32

No audio in Windows

Symptom: No audio in Windows

Actions:

- If you are using powered external speakers that have an On/Off control, verify that the On/Off control is set to the **On** position and the speaker power cable is connected to a properly grounded, functional ac electrical outlet.
- If your external speakers have a volume control, verify that the volume control is not set too low.
- Double-click the speaker icon in the Windows notification area. A master volume-control window opens. Verify that the **Mute** settings are not checked and none of the volume settings is set too low.
- Some models have a front audio panel you can use to adjust volume. If you have a front audio panel, verify that the volume is not set too low.
- Verify that your external speakers (and headphones, if used) are connected to the correct audio connector on the computer. Most speaker cables are color-coded to match the connector.

Note: When external-speaker or headphone cables are attached to the audio connector, the internal speaker, if present, is disabled. In most cases, if an audio adapter is installed in one of the expansion slots, the audio function built into the system board is disabled; use the audio jacks on the adapter.

- Make sure that the program you are running is designed for use in the Microsoft Windows operating system. If the program is designed to run in DOS, the program does not use the Windows sound feature and must be configured to use SoundBlaster Pro or SoundBlaster emulation.
- Verify that the audio device drivers are correctly installed. See Microsoft Windows help system for more information.

An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a drive

Symptom: An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a drive

Action: See “CD problems” on page 32.

Sound comes from one external speaker only

Symptom: Sound comes from one external speaker only.

Actions:

- Ensure that the speaker cable is inserted completely into the connector on the computer.
- Make sure the cable that attaches the left speaker to the right speaker is securely connected.

- Double-click the speaker icon in the Windows notification area. A master volume-control window opens. Verify that the Balance settings are set correctly.

No audio in DOS applications or games

Symptom: No audio in DOS applications or games

Actions:

- Make sure the DOS application or game is configured to use SoundBlaster Pro or SoundBlaster emulation. Refer to the documentation that comes with the application or game for instructions on setting sound-card settings.

CD problems

Select your symptom from the following list:

- “An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a CD drive” on page 32
- “A CD or DVD does not work” on page 32
- “Unable to use a startable (bootable) recovery medium, such as the Product Recovery CD, to start your computer” on page 32

An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a CD drive

Symptom: An audio disc or AutoPlay-enabled disc does not automatically play when it is inserted into a CD drive.

Actions:

- If you have multiple CD or DVD drives installed (or a combination of CD and DVD drives), try inserting the disc into the other drive. In some cases, only one of the drives is connected to the audio subsystem.
- If you are using the Windows 7 operating system, follow the action for “A CD or DVD does not work” on page 32.

If this does not correct the problem, follow the action for “A CD or DVD does not work” on page 32.

A CD or DVD does not work

Symptom: A CD or DVD does not work.

Actions:

- Verify that the disc is inserted correctly, with its label up.
- Make sure that the disc you are using is clean. To remove dust or fingerprints, wipe the disc clean with a soft cloth from the center to the outside. Wiping a disc in a circular motion might cause loss of data.
- Verify that the disc you are using is not scratched or damaged. Try inserting another disc that you know is good. If you cannot read from a known-good disc, you might have a problem with your CD or DVD drive or the cabling to your CD or DVD drive. Make sure that the power cable and signal cable are securely connected to the drive.

Unable to use a startable (bootable) recovery medium, such as the Product Recovery CD, to start your computer

Symptom: Unable to use a startable (bootable) recovery medium, such as the Product Recovery CD, to start your computer.

Action: Make sure that the CD or DVD drive is in the startup sequence before the hard disk drive. Refer to your “Selecting or changing the startup device sequence” on page 21 for information on viewing and changing the startup sequence. Note that on some models the startup sequence is permanently set and cannot be changed.

DVD problems

Select your symptom from the following list:

- “Black screen instead of DVD video” on page 33
- “DVD movie will not play” on page 33
- “No audio or intermittent audio while playing DVD movie” on page 33
- “Playback is very slow or choppy” on page 33
- “Invalid disc or no disc found message” on page 34

Black screen instead of DVD video

Symptom: Black screen instead of DVD video

Actions:

- Restart the DVD player program.
- Close any open files, turn off the computer, and then restart the computer.
- Try a lower screen resolution or color depth.

DVD movie will not play

Symptom: DVD movie will not play.

Actions:

- Make sure that the disc surface is clean and not scratched.
- Check the disc or package for regional coding. You might need to purchase a disc with coding for the region where you are using your computer.

No audio or intermittent audio while playing DVD movie

Symptom: No audio or intermittent audio while playing DVD movie.

Actions:

- Check the volume control settings on your computer and on your speakers.
- Make sure that the disc surface is clean and not scratched.
- Check all cable connections to and from the speakers.
- Use the DVD menu for the video to select a different audio track.

Playback is very slow or choppy

Symptom: Playback is very slow or choppy.

Actions:

- Disable any background programs, such as AntiVirus or Desktop Themes.
- Ensure that video resolution is set to less than 1152 x 864.

Invalid disc or no disc found message

Symptom: Invalid disc or no disc found message

Actions:

- Ensure that a DVD disc is in the drive with the shiny side of the disc facing down.
- Ensure that video resolution is set to less than 1152 x 864.
- On computers that have a CD-ROM or CD-RW drive in addition to a DVD-ROM drive, make sure that the DVD disc is in the drive labeled "DVD".

Intermittent problems

Symptom: A problem occurs only occasionally and is difficult to repeat.

Actions:

- Verify that all cables and cords are securely connected to the computer and attached devices.
- Verify that when the computer is on, the fan grill is not blocked (there is air flow around the grill), and the fans are working. If airflow is blocked or the fans are not working, the computer might overheat.
- If SCSI devices are installed, verify that the last external device in each SCSI chain is terminated correctly. (See your SCSI documentation.)

Keyboard, mouse, or pointing device problems

Select your symptom from the following list:

- "All or some keys on the keyboard do not work" on page 34
- "The mouse or pointing device does not work" on page 35
- "The pointer on the screen does not move smoothly with the mouse" on page 35
- "The wireless keyboard does not work" on page 35

All or some keys on the keyboard do not work

Symptom: All or some keys on the keyboard do not work.

Actions:

- Verify that the keyboard cable is securely connected to the correct connector on the computer.
- If you are using an Enhanced Performance USB keyboard and one or more of the Rapid Access buttons are the only keys that are not working, these buttons might have been disabled or have not been assigned to a function. Use the help system in the Enhanced Performance Customization Keyboard program to help diagnose problems with the Rapid Access buttons.

To open the Enhanced Performance Customization Keyboard program, do one of the following:

- On the Windows 7 operating system, do the following:
 1. Click **Start → Control Panel**.
 2. Click **Hardware and Sound**.
 3. Click **Devices and Printers**.
 4. Double-click **USB Enhanced Performance Keyboard**. The USB Enhanced Performance Keyboard Customization program starts.
- On the Windows 8 operating system, do the following:
 1. Open Control Panel.

2. Click **Hardware and Sound**.
3. Click **Devices and Printers**.
4. Double-click **USB Enhanced Performance Keyboard**. The USB Enhanced Performance Keyboard Customization program starts.

If these actions do not correct the problem, have the computer and keyboard serviced.

The mouse or pointing device does not work

Symptom: The mouse or pointing device does not work.

Actions:

- Verify that the mouse or pointing-device cable is securely attached to the correct connector on the computer. Depending on the type of mouse you have, the mouse cable will connect to either the mouse, serial, or USB connector. Some keyboards have integrated USB connectors that can be used for a USB mouse or pointing device.
- Verify that the device drivers for the mouse or pointing device are installed correctly.
- If you are using a USB keyboard or mouse, verify that the USB connectors are enabled in the BIOS settings. See “Enabling or disabling a device” on page 21.

The pointer on the screen does not move smoothly with the mouse

Symptom: The pointer on the screen does not move smoothly with the mouse.

Action: Erratic movement of the mouse pointer is generally caused by a buildup of dirt, oils, and other contaminants on the ball inside the mouse. Clean the mouse. See “Optical mouse” on page 27 for instructions.

The wireless keyboard does not work

Symptom: The wireless keyboard does not work.

Action: If the Transceiver Communications LED is on and the wireless Keyboard does not work, restart your computer. If restarting your computer does not solve the problem, verify that the following conditions are met:

- The batteries are properly installed.
- The batteries still retain their current.
- The wireless Keyboard is located less than ten meters away from the transceiver.
- The transceiver is fully installed.

Action: If the Transceiver Communications LED is not on, reconnect the transceiver and the keyboard.

Monitor problems

Note: Many monitors have status-indicator lights and built-in controls for adjusting brightness, contrast, width, height, and other picture adjustments. However, the controls vary from monitor type to monitor type. For information about the status lights and using the controls, refer to the documentation that comes with your monitor.

Select your symptom from the following list:

- “Wrong characters appear on the screen” on page 36
- “The monitor works when you turn on the computer, but goes blank after some period of computer inactivity” on page 36

- “The monitor works when you turn on the computer, but goes blank when you start some application programs” on page 36
- “The image appears to be flickering” on page 36
- “The image is discolored” on page 37

Wrong characters appear on the screen

Symptom: Wrong characters appear on the screen.

Action: Have the computer serviced.

The monitor works when you turn on the computer, but goes blank after some period of computer inactivity

Symptom: The monitor works when you turn on the computer, but goes blank after some period of computer inactivity.

Action: The computer is probably set for energy savings with the power-management feature. If the power-management feature is enabled, disabling it or changing the settings might solve the problem.

The monitor works when you turn on the computer, but goes blank when you start some application programs

Symptom: The monitor works when you turn on the computer, but goes blank when you start some application programs.

Actions:

- Make sure the monitor signal cable is securely connected to the monitor and the monitor connector on the computer. A loose cable can cause intermittent problems.
- Verify that the necessary device drivers for the application programs are installed. Refer to the documentation for the affected application program to see if device drivers are required.

The image appears to be flickering

Symptom: The image appears to be flickering.

Actions:

- The monitor might be operating in a low-refresh rate display mode. Set the monitor to the highest, noninterlaced refresh rate supported by your monitor and the video controller in your computer.

Attention: Using a resolution or refresh rate that is not supported by your monitor might damage it. Check the documentation that comes with your monitor to verify the supported refresh rates.

- The monitor might be affected by interference from nearby equipment. Magnetic fields around other devices, such as transformers, appliances, fluorescent lights, and other monitors might be causing the problem. Move fluorescent desk lighting or any equipment that produces magnetic fields farther away from the monitor. If this does not correct the problem, do the following:
 1. Turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.)
 2. Adjust the placement of the monitor and other devices so that they are at least 305 mm (12 inches) apart.
 3. Turn on the monitor.
- You can reset the refresh rate through your operating system Control Panel:
On the Windows 7 operating system, click **Start → Control Panel → Hardware and Sound → Adjust screen resolution → Advanced Settings**. Then click the **Monitor** tab and select a new refresh rate.

On the Windows 8 operating system, open Control Panel and click **Hardware and Sound → Adjust screen resolution → Advanced Settings**. Then click the **Monitor** tab and select a new refresh rate.

- See your operating system documentation or help for further information on monitor settings.

The image is discolored

Symptom: The image is discolored.

Action: The monitor might be affected by interference from nearby equipment. Magnetic fields around other devices, such as transformers, appliances, fluorescent lights, and other monitors might be causing the problem. Move fluorescent desk lighting or any equipment that produces magnetic fields further away from the monitor. If this does not correct the problem, do the following:

1. Turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.)
2. Adjust the placement of the monitor and other devices so that they are at least 305 mm (12 inches) apart.
3. Turn on the monitor.

If these actions do not correct the problem, your monitor might need service.

Networking problems

The following are the most common networking problems. Select your networking problem from the following list:

- “Ethernet problems” on page 37
- “A wireless LAN problem” on page 39
- “A wireless WAN problem” on page 39
- “Bluetooth problem” on page 39

Ethernet problems

For Ethernet problems, select your symptom from the following list:

- “Your computer cannot connect to the network” on page 37
- “The adapter stops working for no apparent reason” on page 38
- “If your computer is a Gigabit Ethernet model and you use a speed of 1000 Mbps, the connection fails or errors occur” on page 38
- “If your computer is a Gigabit Ethernet model, it cannot connect to the network at 1000 Mbps. Instead, it connects at 100 Mbps” on page 38

Your computer cannot connect to the network

Symptom: Your computer cannot connect to the network.

Actions: Ensure that:

- The cable is installed properly.

The network cable must be securely connected to both the Ethernet connector of your computer and the RJ45 connector of the hub. The maximum allowable distance from the computer to hub is 100 meters. If the cable is connected and the distance is within acceptable limits but the problem persists, try a different cable.

- The cable is installed properly.
- You are using the correct device driver.

On the Windows 7 operating system, do the following:

1. Click **Start → Control Panel**.

2. Click **Hardware and Sound**.
3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. If an exclamation mark is displayed next to an adapter name under **Network adapters**, you might not be using the correct driver or the driver is not enabled. To update the driver, right-click the highlighted adapter.
5. Click **Update Driver Software**, and then follow the instructions on the screen.

On the Windows 8 operating system, do the following:

1. Open Control Panel.
 2. Click **Hardware and Sound**.
 3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
 4. If an exclamation mark is displayed next to an adapter name under **Network adapters**, you might not be using the correct driver or the driver is not enabled. To update the driver, right-click the highlighted adapter.
 5. Click **Update Driver Software**, and then follow the instructions on the screen.
- The switch port and the adapter have the same duplex setting.
If you configured the adapter for full duplex, ensure that the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.
 - You have installed all networking software that is necessary for your network environment.
Check with your LAN administrator for the necessary networking software.

The adapter stops working for no apparent reason

Symptom: The adapter stops working for no apparent reason.

Action: The network driver files may be corrupt or missing. Update the driver by referring to the “Solution” description for the procedure to make sure that the correct device driver is installed.

The Wake on LAN feature is not working

Symptom: The Wake on LAN (WOL) feature is not working.

Actions:

- Make sure that WOL is enabled in the BIOS Setup Utility program.
- If it is, check with your LAN administrator for the necessary settings.

If your computer is a Gigabit Ethernet model and you use a speed of 1000 Mbps, the connection fails or errors occur

Symptom: If your computer is a Gigabit Ethernet model and you use a speed of 1000 Mbps, the connection fails or errors occur.

Actions:

- Use Category 5 wiring and make sure that the network cable is securely connected.
- Connect to a 1000 BASE-T hub/switch (not 1000 BASE-X).

If your computer is a Gigabit Ethernet model, it cannot connect to the network at 1000 Mbps. Instead, it connects at 100 Mbps

Symptom: If your computer is a Gigabit Ethernet model, it cannot connect to the network at 1000 Mbps. Instead, it connects at 100 Mbps.

Actions:

- Try another cable.
- Make sure that the link partner is set to auto-negotiate.
- Make sure that the switch is 802.3ab-compliant (gigabit over copper).

A wireless LAN problem

Symptom: You cannot connect using the built-in wireless networking card.

Actions:

- Make sure that your wireless LAN driver is the latest version. Check the Web site and verify the driver version supported by Access Connections is the latest documented in the readme file.
- Make sure that your computer is within range of a wireless access point.
- Make sure that the wireless radio is enabled by double-clicking the Access Connections icon in the Windows notification area.
- Check Network Name (SSID), and your encryption information. Use Access Connections to verify this case-sensitive information.

A wireless WAN problem

Message: Unauthorized WAN card is plugged in - Power off and remove the WAN card.

Action: The WAN card is not supported on this computer. Remove it.

Note: Some computer models do not have a wireless WAN.

Bluetooth problem

Symptom: Sound does not come from the Bluetooth headset or headphone but comes from the local speaker even though the headset or headphone is connected using the Headset profile or AV profile.

Action: Do the following:

1. Exit the application that uses the sound device (for example, Windows Media Player).
2. Open Control Panel.
3. Click **Hardware and Sound → Sound**.
4. Select the **Playback** tab.
5. If you are using the Headset profile, select **Bluetooth Hands-free Audio** and click the **Set Default** button. If you are using the AV profile, select **Stereo Audio** and click the **Set Default** button.
6. Click **OK** to close the Sound window.

Performance and lockup problems

Poor performance and lockup problems can be a result of any of the following:

- “Insufficient free hard disk drive space” on page 39
- “Excessive number of fragmented files” on page 40
- “Insufficient memory” on page 41

Make a selection from the above list to find out more about the corrective actions you can take.

Insufficient free hard disk drive space

Symptom: Insufficient free hard disk drive space

The Windows operating system will slow down and might produce errors if the hard disk drive gets too full.

To check the amount of free space on the Windows 7 operating system, do the following:

1. Click **Start → Computer**.
2. Right-click your C drive entry and then click **Properties**. The amount of free disk space is displayed.

To check the amount of free space on the Windows 8 operating system, do the following:

1. Open the Windows Explorer and click **Computer**.
2. Right-click your C drive entry and then click **Properties**. The amount of free disk space is displayed.

To free up disk space, do any of the following:

- Procedure 1
 1. On the Windows 7 operating system, click **Start → Computer**. On the Windows 8 operating system, open the Windows Explorer and click **Computer**.
 2. Right-click your C drive entry and then click **Properties**.
 3. Click **Disk Cleanup**.
 4. A list of unnecessary file categories is displayed. Select each file category you want to delete, and then click **OK**.
- Procedure 2
 1. Open Control Panel.
 2. Click **Programs**.
 3. Click **Turn Windows features on or off**.
 4. A list of optional Windows components is displayed. Follow the instructions on the screen.
- Procedure 3
 1. On the Windows 7 operating system, click **Start → Computer**. On the Windows 8 operating system, open the Windows Explorer and click **Computer**.
 2. Right-click your C drive entry and then click **Properties**.
 3. Click **Disk Cleanup**.
 4. Click **Clean up system files**.
 5. Click the **More Options** tab.
 6. In the **Programs and Features** area, click the **Clean up** button.
 7. A list of installed programs is displayed. Select the program that you want to remove. Click **Uninstall/Change**.
- Clean out your Inbox, Sent Items, and Deleted Items folders from your e-mail application. The folder names and procedures vary depending on your e-mail application. If you need assistance, see the help system for your e-mail application.

Excessive number of fragmented files

Symptom: Excessive number of fragmented files

Action: Run the Windows Disk Defragmenter program.

Note: Depending on the size of the hard disk drive and amount of data currently stored on the hard disk drive, the disk-defragmentation process might take up to several hours to complete.

On the Windows 7 operating system, do the following:

1. Close any programs that are currently running and close any open windows.
2. Click **Start → Computer**.
3. Right-click your C drive entry and then click **Properties**.
4. Click the **Tools** tab.
5. Click **Defragment Now**, then click **Continue**.
6. Click **Defragment Now** again to start a disk-defragmentation process.

On the Windows 8 operating system, do the following:

1. Close any programs that are currently running and close any open windows.
2. Open the Windows Explorer and click **Computer**.
3. Right-click your C drive entry and then click **Properties**.
4. Click the **Tools** tab.
5. Click **Optimize**.
6. Click **Optimize** again to start a disk-defragmentation process.

Insufficient memory

Symptom: Insufficient memory

In general, the more memory that is installed, the better the Windows operating system runs.

Action: Install additional memory.

Printer problems

Symptom: The printer does not work.

Actions: Verify that:

1. The printer is turned on and is online.
2. Paper is loaded correctly.
3. The printer signal cable is securely connected to the correct parallel, serial, or USB connector on the computer.

Note: Non-IEEE-approved printer signal cables might cause unpredictable problems.

1. Any device drivers and other software that came with the printer are correctly installed.
2. You have assigned the printer port correctly in your operating system, application program, or BIOS settings. For more information about BIOS settings, see Chapter 5 “Using the Setup Utility program” on page 19.

If the problem persists, run the tests described in the documentation that comes with your printer. If you cannot correct the problem, have the computer serviced.

Serial port problems

Use this information to troubleshoot the serial port and devices attached to the serial port.

Symptom: Serial port cannot be accessed.

Actions:

- Make sure the serial cable is securely connected to the serial port on the computer and to the serial device. If the serial device has its own power cord, make sure it is attached to a properly grounded electrical outlet.

- If the serial device has its own On/Off switch, make sure it is in the On position.
- If the serial device has an Online switch, make sure it is in the Online position.
- If the serial device is a printer, make sure paper is loaded correctly.
- Verify that any software supplied with the serial device is correctly installed. Refer to the documentation for the serial-device option.
- Make sure that the serial-port adapter, if you added one, is properly installed and firmly seated.

USB problems

Symptom: The USB connectors cannot be accessed.

Actions:

- Make sure the USB cable is securely connected to the USB connector and to the USB device. If the USB device has its own power cord, make sure it is attached to a properly grounded electrical outlet.
- If the USB device has its own On/Off switch, make sure it is in the On position.
- If the USB device has an Online switch, make sure it is in the Online position.
- If the USB device is a printer, make sure paper is loaded correctly.
- Make sure any device drivers or other software supplied with the USB device is correctly installed. Refer to the documentation for the USB device.
- Reset the device by detaching and reattaching the USB connector.

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Appendix B. Regulatory information

Export classification notice

This product is subject to the United States Export Administration Regulations (EAR) and has an Export Classification Control Number (ECCN) of 4A994.b. It can be re-exported except to any of the embargoed countries in the EAR E1 country list.

Television output notice

The following notice applies to models that have the factory-installed television-output feature.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Electronic emissions notices

The following information refers to Lenovo personal computer machine types 90AG and 10154.

Federal Communications Commission Declaration of Conformity

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by using other than specified or recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:
Lenovo (United States) Incorporated
1009 Think Place - Building One
Morrisville, NC 27560
Phone Number: 919-294-5900



Industry Canada Class B emission compliance statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Union - Compliance to the Electromagnetic Compatibility Directive

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Lenovo cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the installation of option cards from other manufacturers.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.



German Class B compliance statement

Deutschsprachiger EU Hinweis:

Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG (früher 89/336/EWG) zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der Lenovo empfohlene Kabel angeschlossen werden. Lenovo übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der Lenovo verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der Lenovo gesteckt/eingebaut werden.

Deutschland:

Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Betriebsmitteln

Dieses Produkt entspricht dem „Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln“ EMVG (früher „Gesetz über die elektromagnetische Verträglichkeit von Geräten“). Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG (früher 89/336/EWG) in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln, EMVG vom 20. Juli 2007 (früher Gesetz über die elektromagnetische Verträglichkeit von Geräten), bzw. der EMV EG Richtlinie 2004/108/EC (früher 89/336/EWG), für Geräte der Klasse B.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung nach Paragraf 5 des EMVG ist die Lenovo (Deutschland) GmbH, Gropiusplatz 10, D-70563 Stuttgart.

Informationen in Hinsicht EMVG Paragraf 4 Abs. (1) 4:
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取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

Japan compliance statement for products which connect to the power mains with rated current less than or equal to 20 A per phase

日本の定格電流が 20A/相 以下の機器に対する高調波電流規制
高調波電流規格 JIS C 61000-3-2 適合品

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Keyboard and mouse compliance statement for Taiwan

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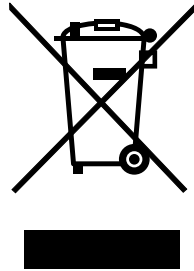
Additional regulatory information

For additional regulatory information, refer to the *Regulatory Notice* shipped with your computer. Depending on the configuration of your computer and the country or region where the computer was purchased, you might have received additional printed regulatory notices. All regulatory notices are available on the Lenovo Support Web site in electronic format. To access electronic copies of the documentation, go to <http://support.lenovo.com> and click **Guides & Manuals**.

Appendix C. WEEE and recycling statements

Lenovo encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Lenovo offers a variety of programs and services to assist equipment owners in recycling their IT products. For information on recycling Lenovo products, go to:
<http://www.lenovo.com/recycling>

Important WEEE information



The WEEE marking on Lenovo products applies to countries with WEEE and e-waste regulations (for example, European Directive 2002/96/EC, India E-Waste Management & Handling Rules, 2011). Appliances are labeled in accordance with local regulations concerning waste electrical and electronic equipment (WEEE). These regulations determine the framework for the return and recycling of used appliances as applicable within each geography. This label is applied to various products to indicate that the product is not to be thrown away, but rather put in the established collection systems for reclaiming these end of life products.

Users of electrical and electronic equipment (EEE) with the WEEE marking must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, and recovery of WEEE and to minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. For additional WEEE information go to:
<http://www.lenovo.com/recycling>

Recycling information

Collecting and recycling a disused Lenovo computer or monitor

If you are a company employee and need to dispose of a Lenovo computer or monitor that is the property of the company, you must do so in accordance with the Law for Promotion of Effective Utilization of Resources. Computers and monitors are categorized as industrial waste and should be properly disposed of by an industrial waste disposal contractor certified by a local government. In accordance with the Law for Promotion of Effective Utilization of Resources, Lenovo Japan provides, through its PC Collecting and Recycling Services, for the collecting, reuse, and recycling of disused computers and monitors. For details, visit the Lenovo Web site at <http://www.lenovo.com/recycling/japan>. Pursuant to the Law for Promotion of Effective Utilization of Resources, the collecting and recycling of home-used computers and monitors by the manufacturer was begun on October 1, 2003. This service is provided free of charge for home-used computers sold after October 1, 2003. For details, visit the Lenovo Web site at <http://www.lenovo.com/recycling/japan>.

Disposing of Lenovo computer components

Some Lenovo computer products sold in Japan may have components that contain heavy metals or other environmental sensitive substances. To properly dispose of disused components, such as a printed circuit board or drive, use the methods described above for collecting and recycling a disused computer or monitor.

Disposing of disused lithium batteries from Lenovo computers

A button-shaped lithium battery is installed on the system board of your Lenovo computer to provide power to the computer clock while the computer is off or disconnected from the main power source. If you want to replace it with a new one, contact your place of purchase or ask for a repair service provided by Lenovo. If you have replaced it by yourself and want to dispose of the disused lithium battery, insulate it with vinyl tape, contact your place of purchase, and follow their instructions. If you use a Lenovo computer at home and need to dispose of a lithium battery, you must comply with local ordinances and regulations.

Recycling information for Brazil

Declarações de Reciclagem no Brasil

Descarte de um Produto Lenovo Fora de Uso

Equipamentos elétricos e eletrônicos não devem ser descartados em lixo comum, mas enviados à pontos de coleta, autorizados pelo fabricante do produto para que sejam encaminhados e processados por empresas especializadas no manuseio de resíduos industriais, devidamente certificadas pelos órgãos ambientais, de acordo com a legislação local.

A Lenovo possui um canal específico para auxiliá-lo no descarte desses produtos. Caso você possua um produto Lenovo em situação de descarte, ligue para o nosso SAC ou encaminhe um e-mail para: reciclar@lenovo.com, informando o modelo, número de série e cidade, a fim de enviarmos as instruções para o correto descarte do seu produto Lenovo.

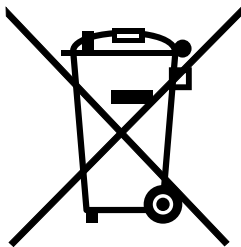
Battery recycling information for Taiwan



廢電池請回收

Battery recycling information for the European Union

EU



Notice: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, go to:
<http://www.lenovo.com/recycling>

Appendix D. Restriction of Hazardous Substances Directive (RoHS)

European Union RoHS

Lenovo products sold in the European Union, on or after 3 January 2013 meet the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("RoHS recast" or "RoHS 2").

For more information about Lenovo progress on RoHS, go to:
http://www.lenovo.com/social_responsibility/us/en/RoHS_Communication.pdf

China RoHS

产品中有毒有害物质或元素的名称及含量

部件名称	有毒有害物质或元素					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr(VI))	多溴连苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件*	X	O	O	O	O	O
硬盘	X	O	O	O	O	O
光驱	X	O	O	O	O	O
内存	X	O	O	O	O	O
电脑I/O 附件	X	O	O	O	O	O
电源	X	O	O	O	O	O
键盘	X	O	O	O	O	O
鼠标	X	O	O	O	O	O
机箱/ 附件	X	O	O	O	O	O

○:表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下
×:表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求
表中标有“×”的所有部件都符合欧盟RoHS 法规。

印刷电路板组件*: 包括印刷电路板及其零部件、电容和连接器
根据型号的不同,可能不会含有以上的所有部件,请以实际购买机型为准

 在中华人民共和国境内销售的电子信息产品必须标识此标志,标志内的数字代表在正常使用状态下的产品的环保使用期限

Turkish RoHS

The Lenovo product meets the requirements of the Republic of Turkey Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (EEE).

Türkiye EEE Yönetmeliğine Uygunluk Beyanı

Bu Lenovo ürünü, T.C. Çevre ve Orman Bakanlığı'nın "Elektrik ve Elektronik Eşyalarda Bazı Zararlı Maddelerin Kullanımının Sınırlandırılmasına Dair Yönetmelik (EEE)" direktiflerine uygundur.

EEE Yönetmeliğine Uygundur.

Ukraine RoHS

Цим підтверджуємо, що продукція Леново відповідає вимогам нормативних актів України, які обмежують вміст небезпечних речовин

India RoHS

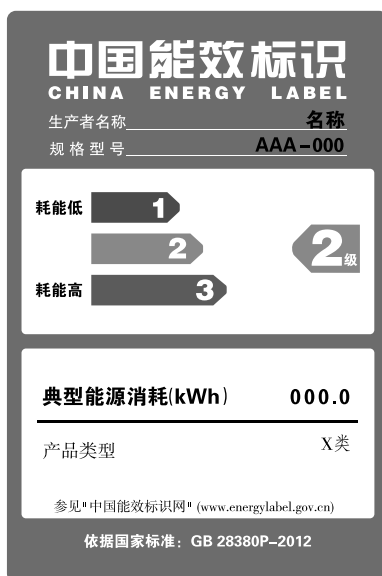
RoHS compliant as per E-Waste (Management & Handling) Rules, 2011.

Appendix E. China Energy Label

微型计算机能效标识声明

为满足中国《微型计算机能源效率标识实施规则》和《微型计算机能效限定值及能效等级》的相关规定和要求，联想公司对其生产及销售的每一台微型计算机产品加施能效标识，声明如下：

1. 如果您的包装箱或者产品上贴有下图所示的标识，您所购买的机器就是经测试符合《微型计算机能效限定值及能效等级》规定的相应能效等级的产品。



Note: 上图以2级能效标贴模板为例进行说明，具体规格型号、能效等级、产品类别和典型能源消耗等信息请以包装箱或产品上粘贴的实际能效等级标贴提供的信息为准，也可登陆“中国能效标识网”<http://www.energylabel.gov.cn>进行详细查询。

2. 如果您所购买机器的包装箱或者产品无上图所示的标识，请您忽略此部分。

《微型计算机能源效率标识实施规则》和《微型计算机能效限定值及能效等级》是由国家发展改革委员会所推行的能效标识制度，旨在通过开发节能产品和有效的节能方式来保护环境。通过使用符合能效标识制度要求的产品可以减少电源消耗、有助于节省开支、营造更清洁的环境并降低温室气体排放量。

联想很荣幸能为用户提供符合相应能效等级设计要求的产品，也鼓励用户购买高能效的产品。

有关能效标识制度的更多信息，请访问“中国能效标识网”<http://www.energylabel.gov.cn>。

Appendix F. ENERGY STAR model information



ENERGY STAR® is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy aimed at saving money and protecting the environment through energy efficient products and practices.

Lenovo is proud to offer our customers products with an ENERGY STAR compliant designation. Some models of the following machine types have been designed and tested to conform to the ENERGY STAR program requirement for computers at the time of manufacture: 90AG and 10154. For more information about ENERGY STAR ratings for Lenovo computers, go to <http://www.lenovo.com>.

By using ENERGY STAR compliant products and taking advantage of the power-management features of your computer, you reduce the consumption of electricity. Reduced electrical consumption contributes to potential financial savings, a cleaner environment, and the reduction of greenhouse gas emissions.

For more information about ENERGY STAR, go to:
<http://www.energystar.gov>

Lenovo encourages you to make efficient use of energy an integral part of your day-to-day operations. To help in this endeavor, set the following power-management features to take effect when your computer has been inactive for a specified duration:

Table 1. ENERGY STAR power-management features

Windows 7 or Windows 8 operating system
Power plan: Lenovo Default • Turn off the display: After 10 minutes • Put the computer to sleep: After 25 minutes • Advanced power settings: – Turn off hard disk drives: After 20 minutes – Hibernate: Never

To awaken your computer from a Sleep or Standby mode, press any key on your keyboard. For more information about these settings, refer to your Windows Help and Support information system.

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